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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/509,433

05/30/2000

ROBIN WALTER MILLS

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DLA PIPER RUDNICK GRAY CARY US, LLP
4365 EXECUTIVE DRIVE
SUITE 1100
SAN DIEGO, CA 92121-2133

EXAMINER

NEGRON, ISMAEL

ART UNIT

PAPER NUMBER

2875

DATE MAILED: 02/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/509,433

Applicant(s)

MILLS ET AL.

Examiner

Ismael Negron

Art Unit

2875

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 January 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 27 and 31-39 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 27 and 31-39 is/are rejected.
- 7) ☒ Claim(s) 31, 32, 37 and 38 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 March 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Group II in the reply filed on December 27, 2005 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Response to Amendment

2. Applicant's amendment filed on December 27, 2005 has been entered. No claim has been amended. Claims 1-26 and 28-30 have been cancelled. Claims 31-39 have been added. Claims 27 and 31-39 are still pending in this application, with claims 27 and 31 being independent.

Title

3. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: Optical Irradiation Device **having** LED and Optic Fibres **Heat Pipe**.

Abstract

Applicant is reminded of the proper content of an abstract of the disclosure.

A patent abstract is a concise statement of the technical disclosure of the patent and should include that which is new in the art to which the invention pertains. If the patent is of a basic nature, the entire technical disclosure may be new in the art, and the abstract should be directed to the entire disclosure. If the patent is in the nature of an improvement in an old apparatus, process, product, or composition, the abstract should include the technical disclosure of the improvement. In certain patents, particularly those for compounds and compositions, wherein the process for making and/or the use thereof are not obvious, the abstract should set forth a process for making and/or use thereof. If the new technical disclosure involves modifications or alternatives, the abstract should mention by way of example the preferred modification or alternative.

The abstract should not refer to purported merits or speculative applications of the invention and should not compare the invention with the prior art.

Where applicable, the abstract should include the following:

- (1) if a machine or apparatus, its organization and operation;
- (2) if an article, its method of making;
- (3) if a chemical compound, its identity and use;
- (4) if a mixture, its ingredients;
- (5) if a process, the steps.

Extensive mechanical and design details of apparatus should not be given.

4. The abstract of the disclosure is objected to because it fails to concisely describe the subject matter of the instant invention. Correction is required. See MPEP § 608.01(b).

The Examiner respectfully suggests amending the abstract as follows:

An optical irradiation device incorporating a cluster **plurality** of LEDs (11, 43) arranged ~~so that shaped facets of adjacent LEDs come together to increase the packing density of LEDs in the cluster. A light guide (41) collects light emitted by the LEDs. Two or more light guides (41) and LED clusters (43) may be arranged in series to produce a single light beam~~ **in one or more clusters, or arrays**. A heat pipe (45) is provided to conduct heat away from the LEDs (47) **allowing the LEDs to be driven to produced more radiation than would be possible without the heat pipe**. ~~The heat pipe (56) may be annular and contain an inner storage space for batteries (60) or the like.~~

Drawings

5. New corrected drawings in compliance with 37 CFR 1.121(d) are required in this application because proposed drawing correction were presented in the paper filed march 15, 2002, however, corrected drawing sheets were never filed. Applicant is advised to employ the services of a competent patent draftsman outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The

corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

6. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the LEDs being thermally connected to two or more heat pipes (as recited in Claim 39) must be shown or the feature canceled from the claim. No new matter should be entered.

7. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

8. Claim 31 is objected to because of the following informalities: line 2 should read "radiation, the one or more LEDS thermally connected to a heat pipe, said ~~pipe~~ **pipe**".

9. Claim 32 is objected to because of the following informalities: line 2 should read "thermal connector positioned between the one or more LEDS and the ~~heat~~ **heat** pipe".

10. Claim 37 is objected to because of the following informalities: it recites the limitation "*a plurality of LEDS*" in lines 1 and 2, such language being unclear if the plurality of LED is a new group of LEDS, or if the applicant intended to refer back to the previously recited "one or more LEDS" (Claim 31, line 1) further defining such "one or more LEDS" as being at least two LED (i.e. "a plurality").

The applicant is advised that in the comparing the claimed invention with the Prior Art, the Examiner assumed that the limitations presented by Claim 37 further defined the previously recited "one or more LEDS" (Claim 31, line 1), and not a new plurality of LED. If the Examiner's assumption is correct, it is respectfully suggested that Claim 37 be amended as follows:

Claim 37 The optical irradiation device according to claim 31, **the at least one or more LEDs** ~~further~~ comprising a plurality of LEDS formed into one or more clusters.

11. Claim 38 is objected to because of the following informalities: it recites the limitation "*a plurality of LEDS*" in lines 1 and 2, such language being unclear if the plurality of LED is a new group of LEDS, or if the applicant intended to refer back to the

previously recited "one or more LEDS" (Claim 31, line 1) further defining such "one or more LEDs" as being at least two LED (i.e. "a plurality).

The applicant is advised that in the comparing the claimed invention with the Prior Art, the Examiner assumed that the limitations presented by Claim 38 further defined the previously recited "one or more LEDS" (Claim 31, line 1), and not a new plurality of LED. If the Examiner's assumption is correct, it is respectfully suggested that Claim 38 be amended as follows:

Claim 38 The optical irradiation device according to claim 31, the at least one or more LEDs further comprising a plurality of LEDs formed into one or more arrays.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

12. Claim 36 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 36 is indefinite as it is not clear what the phrase "more radiation" means.

The applicant is advised that in the comparing the claimed invention with the Prior Art, the Examiner assumed that the limitations presented by Claim 36 to require

the claimed optical device to be able to drive the light emitting diodes to produce more radiation than an optical device without the claimed heat pipe.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

13. Claims 27 and 31-38 are rejected under 35 U.S.C. 102(b) as being anticipated by MASAMI et al. (U.S. Pat. 4,729,076).

MASAMI et al. discloses an illumination device having:

- **a plurality of light emitting diodes (as recited in claims 27 and 31), Figure 4, reference number 1;**
- **a heat pipe (as recited in claims 27 and 31), column 2, lines 30 and 31;**
- **the heat pipe being for cooling the light emitting diodes (as recited in Claim 27), column 2, lines 25-34;**
- **the light emitting diodes being for emitting radiation (as recited in Claim 31), inherent;**
- **the light emitting diodes being thermally connected to the heat pipe (as recited in Claim 31), column 2, lines 25-34;**

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- **the heat pipe conducting heat away from the light emitting diodes (as recited in Claim 31), column 2, lines 25-34;**
- **a thermal connector (as recited in Claim 32), Figure 4, reference number 2;**
- **the thermal connector being positioned between the light emitting diodes and the heat pipe (as recited in Claim 32), as evidenced by Figure 4;**
- **a fan or Peltier device proximate to the heat pipe (as recited in Claim 33), column 2, lines 32 and 33;**
- **a heat sink (as recited in claims 34 and 35), Figure 4, reference number 4;**
- **the heat sink being in thermal contact with the heat pipe (as recited in claims 34 and 35), column 2, lines 28-32;**
- **the heat pipe providing means for cooling the light emitting diodes such that the light emitting diodes are capable of being driven to produce more radiation than they would be capable of without the heat pipe (as recited in Claim 36), inherent;**
- **the light emitting diodes being a plurality of light emitting diodes (as recited in claims 37 and 38), as seen in Figure 4;**
- **the plurality of light emitting diodes being formed in one or more clusters (as recited in Claim 37), as seen in Figure 4; and**

- **the plurality of light emitting diodes being formed in one or more arrays (as recited in Claim 38), as seen in Figure 4.**

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. Claim 39 is rejected under 35 U.S.C. 103(a) as being unpatentable over MASAMI et al. (U.S. Pat. 4,729,076).

15. MASAMI et al. discloses an illumination device having:

- **a plurality of light emitting diodes (as recited in Claim 31),**
Figure 4, reference number 1;
- **a heat pipe (as recited in Claim 31),** column 2, lines 30 and 31;
- **the light emitting diodes being for emitting radiation (as recited in Claim 31),** inherent;
- **the light emitting diodes being thermally connected to the heat pipe (as recited in Claim 31),** column 2, lines 25-34; and
- **the heat pipe conducting heat away from the light emitting diodes (as recited in Claim 31),** column 2, lines 25-34.

16. MASAMI et al. discloses all the limitations of the claims, except the light emitting diodes being thermally connected to two or more heat pipes (as recited in Claim 39).

17. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use two or more heat pipes (as recited in Claim 39), since it has been held that mere duplication of essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8. In this case, adding more than one heat pipe would have flowed naturally to one of ordinary skill in the art as necessitated by the specific cooling requirements of a particular application. In addition, the applicant is advised that MASAMI et al. suggests the use of heat pipes (emphasis added), his use of a plural implying more than one.

Relevant Prior Art

18. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.


Fisher et al. (U.S. pat. 5,029,335), **Maas et al.** (U.S. Pat. 6,402,347) and **Waters** (U.S. Pat. 6,969,180) disclose optical irradiation devices including a plurality of LEDs arranged in clusters/arrays, and having LED cooling means, such means including heat pipes, heat sinks and fans and/or thermoelectric devices (e.g. Peltier devices) to increase the heat transfer rate.

Conclusion

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ismael Negron whose telephone number is (571) 272-2376. The examiner can normally be reached on Monday-Friday from 9:00 A.M. to 6:00 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sandra L. O'Shea, can be reached on (571) 272-2378. The facsimile machine number for the Art Group is (571) 273-8300.

20. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications maybe obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, go to <http://pair-direct.uspto.gov>. Should you have questions on access to Private PAIR system, contact the Electronic Business Center (EBC) toll-free at 866-217-9197.


Sandra O'Shea
Supervisory Patent Examiner
Technology Center 2800


Ismael Negron
Examiner
AU 2875